



# The Bioinformatics Lab: **Web Server**

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# Outline

## ■ Introduction

- ☐ Web server
- ☐ Apache
- ☐ HTTPS
- ☐ PHP

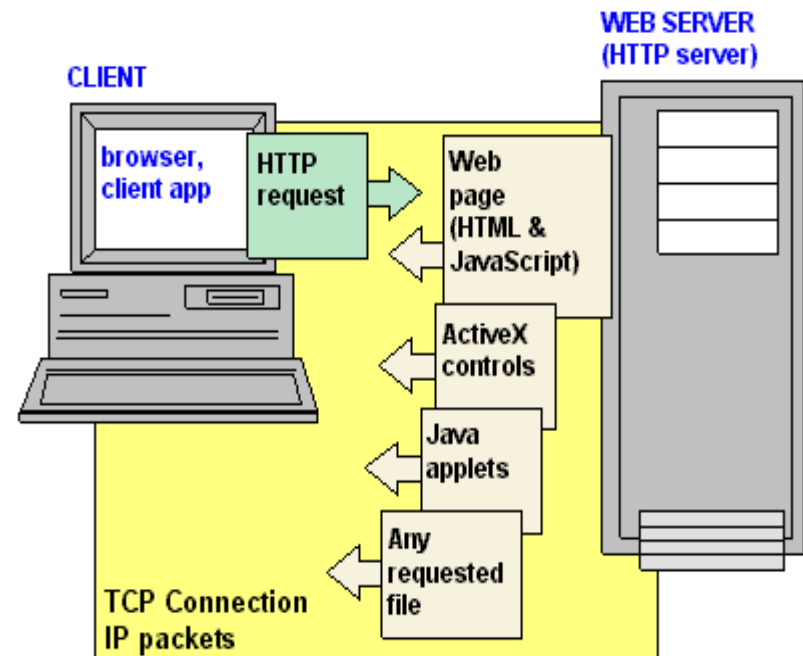
## ■ Programming Challenge

- ☐ Installation and Configuration of Apache
- ☐ Enabling of HTTPS
- ☐ Installation of PHP
- ☐ Access control

# Web Server

- Program that delivers content over a browser using HTTP
- Static content
  - Classical web page design using only HTML/XHTML
  - Page retrieved by different users at different times is always the same, in the same form
- Dynamic content
  - Retrieved from a database
  - Placed on a web page only when needed or asked

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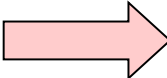


# Apache HTTP Server



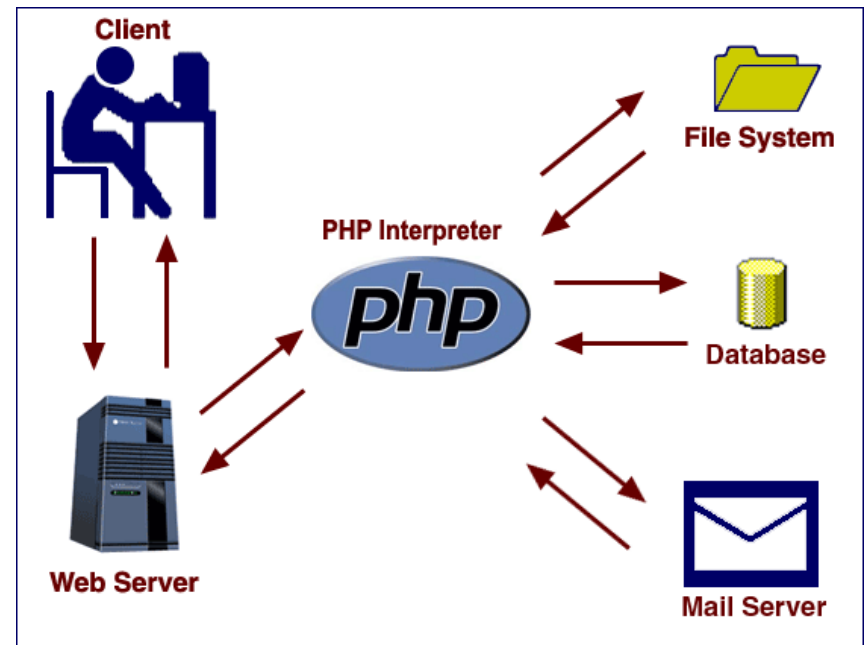
- Since 1996 most popular software
- Versatile and high-performance server that works efficient and stable
- Compiled modules extending core functionality
- Apache2: next generation, scalable, extendable web server
- <http://httpd.apache.org>

# HTTPS

- Combination of HTTP with SSL/TLS protocol
  - Encryption and secure identification of the server by website security testing
  - SSL connection of browser to TCP-port of web server
  - HTTP: [http://](#) and default port 80
  - HTTPS: [https://](#) and default port 443
-  secure!!!

# Hypertext Preprocessor

- Widely used, general-purpose scripting language
- Originally designed for web development to produce dynamic web pages



# Apache Installation and Configuration

- `sudo apt-get install apache2`
- `http://localhost` -> It works!
- `/var/www/index.html`
  
- **Process manager:** `/etc/init.d/apache2 {reload|restart|status}`
- **Configuration file:** `/etc/apache2/apache2.conf`
  
- **Modules:**
  - `a2enmod -> /etc/apache2/mods-enabled`
  - `a2dismod`
- **Directory with files giving information on available modules:** `/etc/apache2/mods-available`

# Virtual Host

- Multiple web sites using one IP address
- /etc/apache2/sites-available
- a2ensite -> /etc/apache2/sites-enabled

NameVirtualHost \*      # designates the IP address/port on the server that will be accepting requests for the hosts

<VirtualHost \*>      # created for each different host to be served

```
ServerName
ServerAlias hostname
DocumentRoot /var/www
ServerAdmin webmaster@hostname
# Logfiles:
CustomLog /var/log/apache2/access2.log combined
ErrorLog /var/log/apache2/error2.log
LogLevel warn
```

<Location />      # applies the enclosed directives only to matching URLs

```
Options Indexes FollowSymLinks MultiViews
AllowOverride None
Order allow,deny
allow from all
</Location>
```

</VirtualHost>



# HTTPS

- Generation of server certificate & private key

```
openssl req -new -x509 -nodes -out hostname.crt -keyout hostname.key
```

- Import the certificate at the browser start

```
# SSL
SSLEngine On
SSLCipherSuite HIGH:MEDIUM
SSLCertificateFile /etc/apache2/ssl/hostname.crt
SSLCertificateKeyFile /etc/apache2/ssl/hostname.key
```

# PHP

- List of available Debian Apache modules:

`apitude search apache2-mod-`

- Installation of PHP5: `apt-get install libapache2-mod-php5`

- PHP5 not compatible with worker-MPM, but slower prefork-MPM

`echo '<?php phpinfo() ?>' >> /var/www/test.php`

- <http://localhost/test.php>

# Access Control

## By IP-Address

- `mod access`: provides access control based on client hostname, IP address, ...

```
# Single IP-address:
Allow from 192.168.16.5
    192.168.16.15
# IP-network:
Allow from 192.168.16.
Allow from 10.1.0.0/16
Allow from
    10.2.0.0/255.255.0.0
# all computer in a DNS-
  Domain:
Allow from informatik.tu-
    muenchen.de
```

## By Password

- `mod auth`: allows the use of HTTP Basic Authentication to restrict access by looking up users in plain text password and group files

```
AuthType Basic
AuthName "internal"
AuthUserFile
    /etc/apache2/htpasswd
Require valid-user
```

- **password file:**

```
htpasswd -c
    /etc/apache2/htpasswd
Username
```